Transportation Synthesis Report

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Transportation Information Management

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SUMMARY
The transportation industry faces a leadership and investment challenge. Although transportation as an industry contributes more than $592 billion (2003) to the Gross Domestic Product, it lags far behind comparable sectors like medicine and agriculture in terms of information, library and knowledge management investments. Some 50 state DOTs, 600 transit agencies and nearly 400 metropolitan planning organizations generate a staggering amount of valuable research; yet the transportation sector lacks a systematic approach to effectively manage its information.

Aspects of this challenge have been addressed in reports such as FHWA's "Value of Information and Information Services" (1998) and NCHRP's "Scoping Study for a National Strategic Plan for Transportation Information Management" (2003) that called for a sustainable network-based information infrastructure. (See this and other relevant documents on Mn/DOT's Web site, Transportation Information Resource Management: Articles and Reports.)

A TRB policy study now under way, "Committee for a Future Strategy for Transportation Information Management," will make recommendations to Congress later this year based on reports like those above, interviews with experts and analysis of relevant models. In this synthesis report we summarize the administrative structure, core services and funding of **National/Regional Library Models**, then review **Trends In Library And Information Services.**

NATIONAL/REGIONAL LIBRARY MODELS

NLM – The National Library of Medicine is the world's largest medical library, providing information to the medical community and general public. As the umbrella for a national network of more than 5,400 regional libraries, the NLM offers a host of products and services including research, outreach programs plus technical and information services. Launched in 1993, the NLM Web portal, one of the first federal agency Web sites, averages nearly 260 million searches annually to its comprehensive databases equipped with user-friendly search tools. In 2004 the site had more than 48 million page hits by an estimated 8 million users. Staff fielded 110,000 customer requests, half of which were via e-mail.

NLM products and services also include PubMed ® with more than 13.5 million searchable journal articles and MedlinePlus, a consumer health information page. The NLM offers extensive biotechnology information and research along with a library collection of more than seven million holdings. Additional NLM services include an interlibrary loan system, reference services, publications and sponsored activities. Research is primarily conducted through the Lister Hill National Center for Biomedical Communications. With a federally funded $330 million annual budget, NLM's administrative structure includes more than 685 staff overseen by a director and board of regents based in Bethesda, Maryland.

NAL – The National Agricultural Library, originally created as the departmental library for the U.S. Department of Agriculture, was declared an official national library in 1962. As part of the Agricultural Research Service, the NAL provides information services and access to more than 3.3 million holdings to a diverse customer base of policymakers, agriculture practitioners, research scientists and the general public.

NAL core services are on a Web portal housing seven information centers with access to food and nutrition, food safety research, water quality, animal welfare and technology transfer information. Its newly enhanced AGRICOLA database has nearly 4.1 million records with more than 32,000 abstracts linking to full text content via OCLC's InterCat system. The Agriculture Network Information Center (AgNIC) contains a powerful search engine on a new multi-tiered technology infrastructure system allowing for quicker document delivery that has reduced wait time from five to two days with nearly 40 percent of documents now delivered electronically. Legal information is offered via the National Center for Agricultural Law Research page while Digitop, an intranet desktop library search tool, is provided to nearly 115,000 USDA employees.

Located in Beltsville, Maryland, the NAL's administrative structure has a board of regents overseeing a director working with a federally funded annual budget of more $20 million. The NAL employs more than 150 employees and 80 contractors (2002).

CNI – The Coalition for Networked Information is a dues-based organization formed in 1990 with nearly 200 members from academia, government agencies, museums, technology consortia and the library community. Sponsored by the Association of Research Libraries and EDUCAUSE, CNI's $1.2 million annual budget helps fund projects and services to develop and manage networked information. CNI's administrative structure is governed by a steering committee overseeing an executive director and five staff members located in Washington, D.C.

SOLINET – The Southeastern Library Network is a dues-based nonprofit membership organization formed in 1973 with some 2600 libraries from 10 states (Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia). Comprising the largest consortia of its type in the country, SOLINET's diverse membership draws from academic, research, public, school, corporate, medical law and specialty libraries.

SOLINET's $48 million annual budget funds products and services such as training and workshops, consulting, digital services, preservation and access, library products and access to comprehensive electronic databases and other networked information. Its administrative structure is governed by a six-member board of directors that oversees an executive office and nearly 60 staff based in Atlanta, Georgia.

TRENDS IN LIBRARY AND INFORMATION SERVICES

The advent of the World Wide Web, along with new and emerging technologies, has created a complex and dynamically changing information and knowledge management landscape. The Internet has revolutionized how consumers obtain information. A 2002 Outsell, Inc. survey of 30,000 U.S. Internet users found that 78 percent got most of their information needs from the Web. The most popular search engine, Google©, allows users to look for information on more than 8 billion Web pages.

Historically, libraries have been central to information-oriented societies; however, networked and electronic information has changed their scope and direction. Challenges facing libraries include content and collections; preservation and access; institutional boundaries; and struggling to remain visible and viable within the Information Age. See "The Invisible Library: Paradox of the Global Information Infrastructure - Challenges Faced by Libraries and Proposed Research Designs" (2003).

Web-based information is now a self-service alternative to traditional library reference services. As the role of libraries continues to evolve, librarians, information providers and knowledge workers are reinventing themselves while merging 'bricks, books and bytes.' The Online Computer Library Center in its "2003 Environmental Scan: Pattern Recognition," surveyed more than 100 members to formulate a snapshot of trends affecting the library landscape.

- **Social landscape –** Social factors are impacting the future of libraries. With a movement toward self-sufficiency, information seekers and consumers seek open access to a seamless flow of Web content at their fingertips.

- **Economic landscape –** Other impacts to the library landscape include economic factors such as library spending coupled with slow economic growth and a demand for return on investment.

- **Technological landscape** – Technological factors along with E-learning and continuous learning are also prompting libraries to suspend old ideas and rethink their role in the information and knowledge continuum. Bricks and mortar are being replaced by bricks and clicks as library leaders choose from a number of new strategic directions.

Digital Libraries
Digital libraries are on the rise and revolutionizing information access and delivery. A September 2004 Special Libraries Association article projected that by 2010 at least 80 percent of all journal issues will be in digital form through a single gateway. Through digital technology, libraries, transportation centers, universities and museums are converting collections into multimedia resources accessible online. While this trend improves access to a vast body of research, images and other content, digitization also brings about intellectual property, copyright and privacy issues particularly with scholarly publications and government records.

'Born digital' content is also increasing. The Government Printing Office over the next two years will transform the way it collects, authenticates, stores and shares federal documents while libraries, museums, universities and research institutions begin to digitize existing collections. 'Born-digital' content is also being generated as the GPO plans by 2008 to digitize 70 percent of all historical documents dating back to the 1787 Federalist Papers. Digitization continues its momentum through the formation of criteria and best practices along with legislation (Public Law 106-554) and a $20-billion Digital Opportunity Investment Trust (DO-IT) bill.

An example of digitization in the transportation sector was in 1996 when the National Transportation Safety Board (NTSB) began putting accident statistics, safety reports, special investigations, annual reports, and other NTSB publications online.

Self-Service
Self-service learners, consumers and information seekers are also shaping library trends. OCLC reports that Google search engines handle more questions in a little over a day than all U.S. libraries provide in a year. The trend toward self-service consumer information has increased with the rise of blogs, podcasting and wikis, which have significantly altered the habits and demographics of Internet users in the past three years.

Self-service consumers in the transportation sector can now apply for licenses and registrations online. Electronic tracking systems have revolutionized the freight industry as customers are able to order, price and track shipments. Global Positioning Systems provide navigation in passenger cars for smarter and safer personal driving.

Growth and Organization of Information
A University of California Berkley report shows that new information has been growing at a rate of more than 30% a year and exists in four physical media – paper, film, magnetic, and optical. Libraries catalog this information with taxonomies, semantics, natural-language recognition, auto-categorization and data visualization methods. All techniques aim to help searchers find what they really want.

Manual cataloging is now being replaced with new classification software designed to save time and money. However, with the variety of data mining tools the exchange of information can become complex and doesn't allow for full interoperability.

A universal syntax, eXtensible Markup Language (XML), is quickly outdating Hypertext Markup Language (HTML) making way for a Semantic Web with the ability to find, share, and combine information more easily. An NCHRP study is underway to explore common formats for data exchange on design, construction, maintenance and transportation safety projects. Once transportation information is digitized and becomes more universal, the possibility exists for knowledge banks and digital repositories (see the DSpace Federation) that will help bring industry into the Information Age.